Edgewood Area - Aberdeen Proving Ground, Maryland 21010-5424
U.S. Army Soldier and Biological Chemical Command

Open-Path Fourier Transform Infrared (FTIR) Spectrometer

CAPABILITIES:

ETG System Specifications

- Range:
  400m (32)
  1000m (120)
- Size and Weight:
  3.0 ft^3; 135 lb
- Operating Temperature and Humidity:
  32-104 °F; 0%-100%

Estimated Minimum Detectable Limits

- GA 0.027 ppm-m
- GB 0.025 ppm-m
- GD 0.024 ppm-m
- GF 0.044 ppm-m
- HD 1.59 ppm-m
- L 0.078 ppm-m
- CG 0.083 ppm-m

Air pollutants and toxic compounds cause a significant hazard to the public. The Edgewood Chemical Biological (CB) Center is home to an Open-path FTIR Spectrometer, which can identify such toxic compounds. FTIR uses light energy through an infrared spectrum to perform atmospheric monitoring, and discover what compounds, and in what concentrations, are in the environment for an air analysis. A beam of infrared light is shot through a telescope-type instrument at a “corner cube” reflector mirror, which allows for the monitoring and analysis of atmospheric pollutants over a distance of 400 meters. An air quality study can be conducted without the limitations in time and scope of manually performing the analysis. FTIR is a valuable tool with many potential commercial applications.

Open-path FTIR is ideal for perimeter monitoring of large “Superfund” waste sites, environmental remediation sites and other source-specific locations. Because of its mobility, FTIR can detect pollutants being emitted from the site without requiring an individual to enter the “hot zone” with all of the protective gear required and needed for operator safety. The Open-path FTIR is capable of detecting more than 250 compounds in near real-time, thus tracking changes in the concentration of pollutants over time.

FTIR is used to perform air quality studies of industrial sites, residential communities, landfills, and more. The technology can identify all compounds present in a cloud of smoke emitted from an industrial plant, and it can predict how a cloud of smoke will disperse due to wind speed. This may be helpful as an emergency evacuation monitor to protect public health. Open-path FTIR technology can also be used to determine air quality conditions in a neighborhood setting; determine source-specific fenceline fugitive and stack pollutant emission concentrations from selected industries; identify compounds emitted from factories as they change processes, batches or shifts; study impurities issued from vehicles in traffic; perform perimeter monitoring around remediation sites; determine ambient air quality pollutants in a Community Based Environmental Protection area; and determine the effectiveness of a water spray curtain on cloud concentrations.

The U.S. Army at Edgewood owns a number of complete FTIR systems, and employs skilled personnel to run them. It operates the largest collection of machinery anywhere. Army engineers can operate the instrument, perform a data analysis of privately compiled information and verify information. As required, FTIR would be an ideal tool for use by refineries, environmental agencies, citizen groups, and state and local governments.

For additional information, please E-mail cbservices@sbccom.apgea.army.mil.

For information on Technology Transfer applications, please contact us by E-mail (technical.outreach@sbccom.apgea.army.mil) or by fax to 410-436-6529.

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